



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/865,404	05/25/2001	Marc F. Hamel	M0627/7018 (LMG)	4280

23628 7590 03/31/2004

WOLF GREENFIELD & SACKS, PC
FEDERAL RESERVE PLAZA
600 ATLANTIC AVENUE
BOSTON, MA 02210-2211

EXAMINER

GORDON, BRIAN R

ART UNIT

PAPER NUMBER

1743

DATE MAILED: 03/31/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/865,404	HAMEL ET AL.	
	Examiner	Art Unit	
	Brian R. Gordon	1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12-31-03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-12, 39-41 and 61-72 is/are pending in the application.
- 4a) Of the above claim(s) 69-72 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 66-68 is/are allowed.
- 6) ☒ Claim(s) 2, 4-12, 39, 61 is/are rejected.
- 7) ☒ Claim(s) 3, 40, 41 and 62-65 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Newly submitted claims 69-72 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claim 69 is distinct from the other independent claims (specifically claim 66). Claim 69 does not require the specific structure of the manually operable apparatus as required by claim 66. Claim 66 does not require the manually operable apparatus to be structurally removable and able to couple pistons in said dispensing head.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 69-72 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Response to Arguments

Applicant's arguments filed December 31, 2003 have been fully considered but they are not persuasive. As to rejection of claim 39 as being anticipated by Yahiro, applicant asserts Yahiro does not disclose sliders that move in a horizontal direction. Applicant claims have been amended to recite horizontal extending and movable slideways. The examiner asserts that the claim makes no reference as to establish what is meant by horizontal.

The horizontal direction is not established in reference to the arrangement or position of any other structure or elements of the device. As such horizontal direction is

Art Unit: 1743

a matter of perspective or orientation of the device. The examiner asserts that the device of Yahiro would meet the limitations of the claim if one chooses to rotate the device at 90 degrees from the position as seen in figure 2. In such a position the direction in which the sliders move would be horizontal. For example, as recognized by applicant, the vertical direction as cited by Yahiro is established and defined in reference to the surface 21A.

As to the applicant's comment's directed to Meltzer, the examiner asserts the Meltzer may be applied to the limitation of claims 4-6, for claim 39 does not recited the negative limitation directed to the nozzle as claimed in claim 66

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear what is meant by the phrase "adjacent ones of the openings of the chambers." It appears as if the phrase should read "all space between the adjacent openings of the chambers."

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 2, 10, and 39 are rejected under 35 U.S.C. 102(e) as anticipated by Yahiro US 6,182,719 or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yahiro.

Yahiro discloses a distribution apparatus for distributing liquid samples using distribution tips, which distribution tips are held in a tip rack placed in a feeder section and fitted relative to a distribution head. The distribution apparatus has a fitting stage, provided in a space between the feeder section and a distribution stage, for supporting the tip rack and fitting the distribution tips. A distribution tip alignment device is provided in the fitting stage, which aligns dislocated distribution tips at the bottom ends to a correct formation by making contact with the side wall surfaces of the distribution tips. The tip ends of the distribution tips, which are attached to nozzles of the distribution head, are aligned by the distribution tip alignment device at a certain specific pitch, at the time when the distribution tips are attached to the nozzles, or after they are attached to the nozzles. By so doing, a liquid sample can be distributed to small diameter wells without having a dislocation problem.

A transfer table 31 is horizontally supported by pillars 30 standing on the base plate 2. A Z axis table 33 is provided on the transfer table 31 and is equipped with a Z axis motor 34. A distribution head 20 (dispensing head) is installed on the Z axis table 33 (means for retaining dispensing head). The distribution head 20 can move horizontally by operation of the motor 32 on the transfer table 31 such that a range of the movement covers the fitting stage 6, the distribution stage 3 and a discard box 36 provided at a side of the machine bed 1. The distribution head 20 moves vertically by

operation of the Z axis motor 34 on the regions of fitting stage 6 and distribution stage 3. The distribution head 20 is described with reference to FIG. 2. As shown in FIG. 2, an "L" shaped block 21 is engaged via a plate 35 with the Z axis table 33 (housing). The "L" shaped block 21 is provided with a pair of guide rails 23 vertically disposed on the vertical surface 21a. A slider 24 (slideways) that is freely slidable with respect to the guide rail 23 is connected with a block 25. The block 25 is equipped with a plurality of plungers 26 arranged in a lattice form. The plungers 26 (plurality of pistons in plurality of chambers) are engaged with a plurality of nozzles 27, which have been provided in a horizontal plane 21b of the "L" shaped block 21 with the same arrangement as that of the plunger 26.

The horizontal direction is not established in reference to the arrangement or position of any other structure or elements of the device. As such horizontal direction is a matter of perspective or orientation of the device.

It would have been obvious to one of ordinary skill in the art to recognize that the device of Yahiro would meet the limitations of the claim if one chooses to rotate the device at 90 degrees from the position as seen in figure 2. In such a position the direction in which the sliders move would be horizontal. For example, as recognized by applicant, the vertical direction as cited by Yahiro is established and defined in reference to the surface 21A.

7. Claim 4-6 rejected under 35 U.S.C. 103(a) as being unpatentable over Yahiro as applied to claims 2, 10, and 39 above, and further in view of Meltzer US 5,306,510.

Yahiro does not disclose that the device comprises flexible seals for the tips.

Meltzer discloses an automated pipetting system comprising interchangeable tip holders of improved double o-ring design.

The lower ends 35 of the Z-axis racks are threaded for screwing into tip holders 36 shown FIGS. 6-8. Threaded end 35 is screwed into receptacle end 36a of tip holder 36, thereby clamping a teflon top hat 37 and O-ring 38 at its lower portion so as to act as a fluid seal. Passage 36b of tip holder 36 communicates with tubing 32 which is pressed over top hat 37 and passes through hollow rack 27, through tubing guide 80 and exits on side of the frame for connection to external pumps. Lower end of tip holder 36 has a slight taper so that the tip 36 can be smoothly inserted into the similarly tapered upper mouth Y of a disposable tip 39. Shoulder (contact surface) 36c is provided for abutting contrast against the upper face (shoulder) of tip 39 (FIG. 8), so that it is positively positioned and held on tip holder 36. A pair of O-rings 36e are held in the grooves 36f formed on the tapered portion 36c of tip holder 36 so as to provide an air tight seal between tip 39 and tip holder 36 and a friction surface for retaining tip 39 on the tip holder 36 (Figure 8).

As to the the o-ring comprising silicon, it is well known in the art that o-rings, washers, and other sealing means are manufactured from silicon rubber when employed for establishing leak proof connections between devices used for transporting fluids.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of Bivert et al. to incorporate the o-ring assembly as

taught by Meltzer for improved sealing between the disposable tips and the nozzles to prevent fluid leakage around the tips.

8. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yahiro in view of Meltzer as applied to claims 4-6 above, and further in view of Maeda.

Yahiro in view of Meltzer does not disclose a clamping means and urging means as claimed by applicant.

However Maeda discloses a dispensing head which is movable upward and downward as a whole and comprises a plurality of plungers supported by a plunger plate, drive means for moving the plunger plate upward and downward, a plurality of cylinders in which the plungers slidably fit, and a plurality of nozzles arranged at the lower ends of the cylinders and having configurations adapted to engage airtightly with holes for holding specific dispensing tips, the plurality of nozzles being supported by a single nozzle holder, which is built to be detachable from said dispensing head. According to the invention, only the nozzle holder that support nozzles has to be replaced with another holder conforming to dispensing tips of different dimensions. The arrangement facilitates the replacement and make the dispenser available at lower cost.

FIGS. 7 and 8, in addition to FIGS. 4 to 6. Under the cylinder block 67, there is located a nozzle holder 97 which has a number of holes supporting an array of (small) nozzles 99 or (large) nozzles 101, preferably fitting loosely, in an arrangement corresponding to the cylinders. Loosely received in the holes, the nozzles have allowances to move slightly for a proper airtight fit when their ends are engaged with the upper end openings of tips. In the absence of the allowances, some of the many tips

could fail to fit properly and be left unengaged in the rack 9 (FIGS. 3 and 9). The nozzles 99 or 101 have an annular extended head each with which to be fitted in the holes of the nozzle holder 97. The nozzle holder 97 is urged by clamps 104 at the lower ends of clamp plates 103 against the bottom of the cylinder block 67, whereby the upper ends of the nozzles are forced in contact with the lower ends of the cylinders 23.

Preferably, an elastic plate such as silicone plate 109 is sandwiched between the nozzle holder 97 and the bottom of the cylinder block 67 to establish airtight communication between the cylinders 23 and the nozzles 99 or 101.

Each clamp plate 103 is supported by the vertical bracket 65 which in turn is held by the horizontal bracket 77, in such manner that the clamp plate can slide vertically along the outer surface of the bracket. A pair of clamp plate guides 105 are fixed to the cylinder block 67 (FIG. 6), and the clamp plate 103 is formed with slots 111 in which the guides 105 fit. A plurality of tension springs 113 are secured at the upper ends to the bracket 65, and the lower ends of the springs 113 are secured to the upper end of the clamp plate 103. As a consequence, the clamp plate 103 is normally biased upward, forcing the nozzle holder 97 against the cylinder block 67 with the aid of the clamps 104 to provide desired airtight communication between the cylinders 23 and nozzles 99 or 101. The strength of the springs 113 can be controlled by adjusting the positions of screws 115.

In conjunction with FIGS. 4 to 6, means for removing the nozzle holder 97 when required will now be explained. Release pins 117 are fixed to each clamp plate 103 and extend through slots formed in the bracket 65 to the inside. As it descends, the plunger

plate 91 comes into contact with the release pins 117 and then forces them farther downward against the urgings of the springs 113, and accordingly the clamp plate 103 comes down to release the nozzle holder 97. Thus the nozzle holder 97 descends under its own weight until it rests on holding bends 108 of holder supports 107 secured to the cylinder block 75. In this state the nozzle holder 97 can be horizontally pulled out together with the nozzles 99. This state also allows the nozzle holder to be replaced with another holder of different dimensions.

It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the modified device of Yahiro to incorporate the clamping and urging means as taught by Maeda in order to allow for the dispense head to be replaced with another head of different dimensions.

2. Claims 11-12 and 61 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yahiro as applied to claims 2, 10, and 39 above, and further in view of Yiu US 6,464, 943.

Yahiro does not disclose that the device may comprises a dispense head that may inserted into the device without a nozzle extending into the tips.

Yiu discloses a fluid dispensing device comprising the combination of a support member operatively supporting an upper fluid manifold having a plurality of fluid outlets.

"The hollow needle support member 30 (dispensing head) has opposed side brackets 24 which brackets 24 (slideways) are supported from the side walls 22 of upper fluid manifold 18 in limited vertical movement fashion by reason of opposed rods 26 (clamping means)."

It should be noted that the side walls 22 of upper fluid manifold 18 have a simple snap and hinge connector on opposite sides thereof so as to enable opposing lateral bracket members 24 to be moved upwardly from the position shown in FIG. 2, once the hollow needle support member 30 is releasably and slidably placed therein to be moved vertically upwardly into the position shown in FIG. 1 so as to form a fluid-tight connection between the upper surface 31 of the hollow needle support member 30 to thereby form relatively fluid-tight gas chamber 19. Sealing, O-ring 41 or the like, (FIG. 8), may also be utilized to insure against fluid leakage from compartment 19.

The through bores 34 are smaller in diameter than the lower portion thereof which is enlarged to support hollow needles, pipettes or tubes 38 (disposable tips). The number of hollow needles or depending pipettes 38 through which a fluid is directed from the upper manifold 18 corresponds in number to the cells or compartments found in assay tray 50.

FIG. 12 reflects another embodiment of a specific type of hollow tube 100 is shown which in this case is of shorter length and is configured so as to have plastic disposable tips 102 frictionally and releasably secured thereto so that instead of subjecting the upper hollow needle or tube support member 30 to sonic cleaning or other sterilization, the extenders 102 because they are plastic and disposable may be taken off and discarded with new tips 102 put in place so as to prevent any possibility of cross contamination.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of Yahiro by employing the dispense head arrangement

of Yiu to ensure that contamination of the cells does not occur when using different fluids.

Allowable Subject Matter

9. Claims 3, 40-41, and 62-65 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

3. Claims 66-68 allowed.

10. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach nor fairly suggest a device the comprises a retaining means comprising a plurality of threaded shafts mounted to the dispensing head; a plate disposed within the housing; cutouts on the plate for receiving the threaded shafts; and a knob threadably mounted on each threaded shaft, said knobs being rotatable about the shaft to be screwed into engagement with said plate for securing said dispensing head to the plate.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Friswell et al. disclose a liquid handling system with automatically interchangeable cannula arrays.


Hudson Control, PerkinElmer, Tomtec, Apricot, Beckman, and Robotec disclose devices with interchangeable dispense heads.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian R. Gordon whose telephone number is 571-272-1258. The examiner can normally be reached on M-F, with 2nd and 4th F off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

brg


Jill Warden
Supervisory Patent Examiner
Technology Center 1700